1.0 Purpose

USBP is requesting closure on Recommendation 6, GAO-14-368.

Recommendation 6: *To improve the acquisition management of the Plan and the reliability of its cost estimates and schedules, assess the effectiveness of deployed technologies, and better inform CBP's deployment decisions, once data on asset assists are required to be recorded and tracked, the Commissioner of CBP should analyze available data on apprehensions and seizures and technological assists, in combination with other relevant performance metrics or indicators, as appropriate, to determine the contribution of surveillance technologies to CBP's border security efforts.*

2.0 Status and Update

While recognizing the progress the USBP has made toward the implementation of this recommendation, GAO needs to "review documentation showing that the USBP has analyzed available data on apprehension and seizure and technological assists, in combination with other relevant performance metrics to determine the contribution of surveillance technologies".[1]

The USBP has utilized the ongoing development of its requirements management process to support GAO-14-368 responses. The USBP will frame the response to ongoing audit questions through the six steps of the requirements management process (RMP). The RMP provides the analytical rigor to inform planning and deployment decisions so that the most effective and affordable solutions are implemented to fill the identified gaps.

While each step of the process contributes to informing decisions that ensure effective and affordable solutions, there are two steps that use specific measures that more directly respond to the GAO recommendations for assessing technology contributions, these are the Capability Gap Analysis Process (CGAP) (from Mission Analysis Step) and Technology Performance Measures (from Life Cycle Management Step). These measures are described in section 2.1 and examples of analysis are provided in the (b) (7)(E) case study.

The (b) (7)(E) case study is provided in Appendix A . The case study is also presented in the context of the six steps of the requirements management process described below in section 2.1.

2.1 Overview of the Requirements Management Process (RMP)

This section provides an overview of the RMP for context in the audit response. The response to the GAO recommendation begins in Section 2.2.

The United States Border Patrol (USBP) Operational Requirements Management Division (ORMD) has developed the *Requirements Management Process* (RMP) as a consistent and repeatable, top down and bottom-up approach to collect, manage, disseminate and action initial capability and operational

[1] http://www.gao.gov/products/GAO-14-368

requirements. The process enables USBP to capture capability gaps directly from the field and justify them with qualitative and quantitative analysis to support operational and acquisition decisions. Accordingly, investment decisions are based on Department of Homeland Security (DHS), Customs and Border Protection (CBP) and USBP planning and resource guidance.

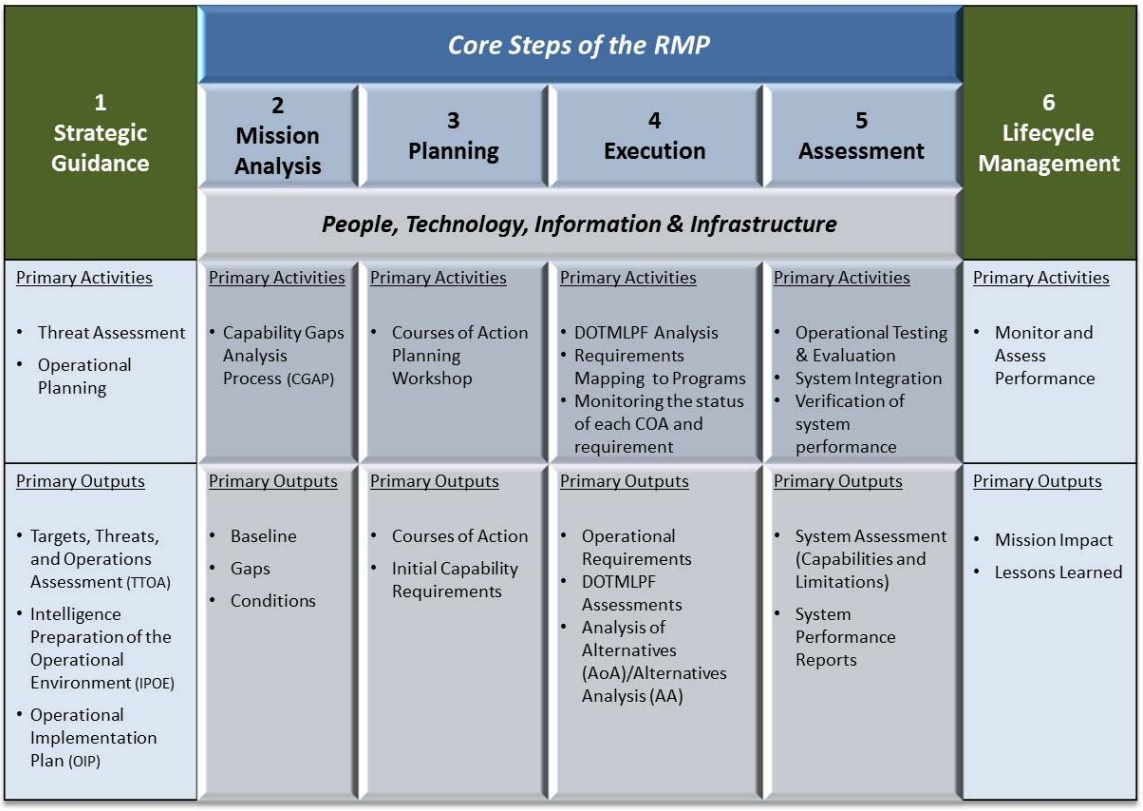


Figure 1 Requirements Management Process Summary

In order to fully understand technology's contributions to border security, the environment must be examined holistically with technology and border patrol assets working in conjunction as a "system-of-systems." [2] The CGAP is a "bottom-up" assessment to capture data from the field level in order to articulate the effects of technology on border security in the context of everyday border patrol operations from the field's perspective. The RMP steps are summarized below:

> **Step 1: Strategic Guidance** - Strategic Guidance begins with the receipt of the overall USBP strategic vision, goals, missions, and objectives, as well as the state of the threat. USBP must interpret this strategic guidance within the context of the three border areas (Northern, Southwestern, and Coastal) and their individual corridors and sectors. The Strategic Guidance may not change significantly from year to year; but it shapes how USBP will achieve its mission. Sector will provide an overall assessment of current and future threats to the USBP mission, and the broad operational plans to counter those threats. Sectors also evaluate the data provided from the stations.

[2] GAO. 2014. *Additional Actions Needed to Strengthen Management and Effectiveness.* Report to Congressional Requesters. GAO-14-368, 46.

Step 2: Mission Analysis - Building on intelligence information and strategic guidance from step 1, mission analysis provides the following:

- Baseline description of current Station capabilities
- Capability gaps
- A set of detailed use cases with evidence that can support decision making and act as an operational narrative for later decisions, briefs, audits and impact stories.

The primary process used to conduct mission analysis is the Capability Gap Analysis Process (CGAP)[3]. The CGAP analysis includes both quantitative and qualitative measures. These measures include:

- **Surveillance (Area Coverage).** Percentage of identified areas under surveillance. This assessment provides insight to the overall surveillance coverage in identified zones, (b) (7)(E) .
- **Infrastructure and Accessibility.** (b) (7)(E)
- **Manpower Deployments.** Manpower deployments over a 30 day period to gauge average staffing distribution and average staffing by zone. This provides a baseline to understand, visualize, and describe agent-to-task resourcing by individual zone and overall station staffing distribution.
- **Mission Essential Task Effectiveness rating.** Qualitative analysis designed to capture subject matter expert input, perception, and perspective on the operational impacts of terrain and adversary actions in identified zones. Survey responses are provided for the seven identified mission essential tasks (METs) as well as response and vanishing time, to assess the effectiveness of current capabilities (to include assets such as technologies) to achieve the MET.

Step 3: Planning - During this step, capability gaps within each Area of Responsibility (AOR) are examined in detail to identify Courses of Action (COAs) that can be implemented in the near-term and initial capability requirements that will require resources and potentially technology development to satisfy for the longer term. In addition, USBP prioritizes capability requirements across the three borders based on current threats and risks.

Step 4: Execution - USBP engages solution stakeholders to deliver capabilities against current needs and future needs. In this stage, USBP also participates in the evaluation of alternative solutions to address requirements. CBP Planning, Programming, Budgeting and Accountability activities are performed in this phase. Program identification and requirements "hand-off" to program managers are conducted in this phase. USBP portfolio managers and CBP capability developers form their program teams and begin the delivery of capabilities. Cost, Schedule and Performance requirements are reported and actioned on to ensure a successful, cost effective deployment.

[3] Described in detail through 2014 Response – Response is attached

Step 5: Assessment - This step includes monitoring implementation and fielding of solutions (i.e., acquisition management - reliability of its cost estimates and schedules), and the test and evaluation of those solutions in the field.

Step 6: Lifecycle Management - The final step of the RMP is *Lifecycle Management*. This is an assessment of how the solutions are performing over time. Necessary actions to update and manage the operational requirements are also identified and fed back into the core RMP. A technology roster provides a comprehensive list of current and potential solutions for US Border Patrol planning efforts and to provide a central document that articulates qualitative and quantitative benefits of technologies. Potential qualitative and quantitative measures for the current and proposed technologies were identified as outlined in Table 1 below. Analysis of asset assist measures is underway, while data collection has started to determine remaining measures.

Table 1. Proposed Qualitative and Quantitative Technology Measures

Technology Classes	Technologies	Mission Attributes	Quantitative Measures	Qualitative Measures[4]
Fixed	Current: Block 1, (b) (7)(E) Planned: IFT, (b) (7)(E)	• Improved SA • Deter • Agent Safety	• Number/Percent of Technology Assists on Apprehensions and Seizures[1] • Percent Area Covered by Technology • Number/Percent of Detections and Identifications in Coverage Area Attributed/Not Attributed to Technology[2] • Number/Percent Apprehensions and Seizures in Coverage Area Attributed/Not Attributed to Technology • Percentage/Number of Turn Arounds and Got-Aways in Coverage Area • Availability, Reliability, Maintainability[3]	• Surveillance Capability Assessment in AoR[5] • Effectiveness for Detect and Identify • Effectiveness for Respond • Effectiveness for Deter • Effectiveness for Apprehensions and Seizures • Technology User Interface and Training Effectiveness • Impact on Agent Safety • Impacts to AoR[6]
Mobile	Current: (b) (7)(E)	• Improved SA • Deter • Mobility • Rapid Response • Agent Safety	In addition to above: • Time to Move, Set-up and Deploy	In addition to above • Effectiveness for Mobility (i.e., ability to quickly deploy and operate the system in different locations)
Relocatable	Current: (b) (7)(E)	• Improved SA • Deter • Mobility	In addition to above: • Time to Relocate, Set-up and Deploy	In addition to above • Effectiveness for Mobility (i.e., ability to quickly

	(b) (7)(E) Planned: (b) (7)(E), (b) (5)	• Rapid Response • Agent Safety		deploy and operate the system in different locations)

1: Based on improvements to operational data collected per response to Recommendation 5 (CBP will require data on asset assists to be recorded and tracked within the Enforcement Integrated Database)
2: Investigating availability of detection and identification data in ICAD data; qualitative measures will be used if operational data is insufficient to support quantitative measures
3: Based on the data collected on the technology uptime, downtime, and the number of hours per day that the technology is available for use, time and/or cost of repairs.
4: Qualitative Measures: Through operational assessments (e.g. periodic assessments for classes of technologies to collect data in support of qualitative measures); qualitative assessments of the Station effectiveness will be used if operational assessment of the technology is not feasible. This includes feedback from station surveys.
5: In support of SA Score development, assess SA scores associated with technologies and assess technology contributions to SA (Ref: OBP Response for GAO 13-25). Note that SA Score development has transitioned to Surveillance Capability Assessment Score.
6: Assessment of overall impact to AoR based on quantitative measures (e.g., decrease in drug related crimes and illegal activities, decrease in number of arrests, decrease in complaints by ranchers and other citizens, decrease in destruction of public and private lands and property) and as available, qualitative feedback from local law enforcement, public and private stakeholders

The analysis of the contribution of surveillance technologies to CBP's border security efforts is documented within this RMP framework.

2.2 Audit Response

2.2.1 Assessment of the Effectiveness of Deployed Technologies on USBP Mission

In February 2015, GAO provided documentation stating that the agency had yet to analyze data on asset assists, in combination with other relevant performance metrics and indicators to determine the contributions of surveillance technologies to its mission. However, USBP indicated that CGAP would enable the agency to examine the effects of technology and other Border Patrol assets such as agents, infrastructure, in the context of everyday border patrol operations. Border Patrol has made progress in implementing CGAP across the entire border, developing initial capability requirement for gaps and has started to assess performance metrics. A summary of progress is as follows:

- CGAP assessments were conducted throughout FY2014 and FY2015 across 144 stations. USBP used a risk based approach to identify priority areas and threats that need to be addressed (Step 1, Strategic Guidance) and field input on gaps/operational conditions within the AoR (Step 2, Mission Analysis).
- The data collected from the station CGAP (step 2, Mission Analysis) was used during FY2015 to support planning activities through planning workshops. USBP assessed what its capability requirements were and what technology solution (or other non-materiel solution) could best address the threat (Step 3, Planning) where over 170 capability requirements were documented. In FY2015, USBP provided the 170 capability requirements to solution

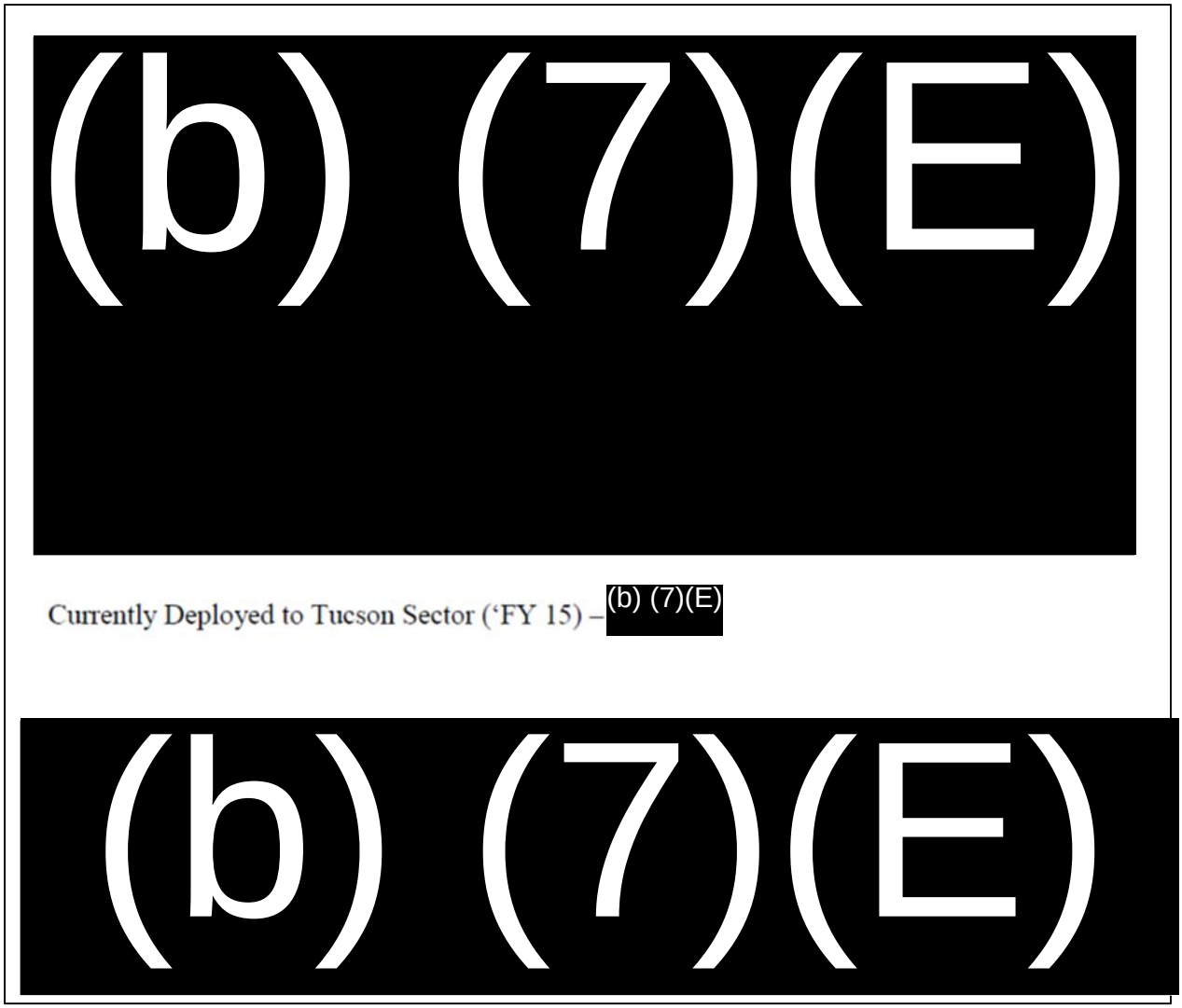
stakeholders. The stakeholders are in the process of mapping the capability requirements to existing programs and solutions (Step 4, execution).

- Step 5 is where USBP benchmarks initial proven effectiveness and impact. As solutions are deployed, BP will participate in Operational Test and Evaluation (OT&E), User Assessments and Capability and Limitation Workshops to assess that capability requirements are satisfied and to baseline performance. In FY2015, BP has participated in (b) (7)(E) and IFT deployment activities and has started to assess performance measures as shown in the (b) (7)(E) example.
- Monitoring of effectiveness over time is addressed in 6, Lifecycle Management. BP has started analysis of technology assists with apprehensions and seizures, along with Technology Performance Measures, as indicated in the USBP Memorandum for the Record 14-27647 "60-Day Status Report on GAO Final Report, Arizona Border Surveillance Technology Plan, (GAO-14-368)". The USBP submitted the table of milestones as shown in Table 2. Status is as follows:
    - Analysis of technology assists, along with other technology measures is demonstrated in the (b) (7)(E) Case Study
    - Updates to the Technology Roster continue to be developed. (b) (7)(E) (b) (7)(E) entry in the Technology Roster is provided below as an example. The Technology Roster is still very much at a concept phase and additional work will continue as more and more data arrives.
    - The Situational Awareness Score development has transitioned to the Surveillance Capability Assessment. The CGAP team and Requirements Management group within USBP will still closely support its development.

TABLE 1: Time Line to Develop Technology Performance Measures

	Milestone: End of FY 2014 Current Activities	Milestone: End of FY 2015	Milestone: End of FY 2016
Technology Asset Performance Plan	1. Support Situational Awareness (SA) Score development. (Ref: OBP Response for GAO 13-25) 2. Request and collect metrics within USBP and CBP. Review current and proposed measures and update. 3. Create technology roster, with qualitative and proposed quantitative impacts. Submit for vetting.	1. Create Operational Baseline using Integrated Database statistics (Operational Effectiveness) with S/A measures for high priority areas. 2. Update technology roster and evaluate, potential impacts both qualitatively and quantitatively for specific technology assets.	1. Create "Tool Box" document explaining qualitative and quantitative impacts of technology and tactical infrastructure in specific areas of the border environment.

Table 2. Time Line to Develop Technology Performance Measures



(b) (7)(E) in the Technology Roster

Due to limited capacity, USBP has not yet been able to apply the same rigor and process to lifecycle management (step 6) as it has to the five preceding steps. It is the USBP's intent to further develop and mature this process to ensure a complete "cradle to grave" toolset and process is available to planners and decision makers. With this in mind, the USBP has not ignored the need to understand deployed technologies and lifecycle decisions. There is still work to be done but the initial steps have been implemented toward assessing CGAP data with technology assist data and other measures to determine the contributions of surveillance technologies to its mission.

Appendix A: (b) (7)(E) Case Study

(b) (7)(E) station is the station where the RMP process has been implemented the furthest. It is also a station where initial procurement and deployment decisions were made prior to developing the RMP. We chose this location for the audit response because we are actively moving into the lifecycle management phase for (b) (7)(E) and IFT.

It was initially selected as the pilot for the CGAP in 2013. The planning conducted in (b) (7)(E) in 2015 utilized the gaps collected in 2013, along with the strategic guidance, operational data, and M&S to plan courses of action to fill gaps. USBP is in the process of conducting assessments of the deployments to determine the contribution of surveillance technologies to the border security mission. (b) (7)(E) data is being collected on apprehension/seizure data to correlate with technology deployment locations to determine the effect of surveillance technology on mission effectiveness. The (b) (7)(E) has recently been deployed and the IFT undergone initial deployment and is now undergoing Limited User Test..

Step 1 Strategic Guidance

In October of 2014, using the strategic guidance inputs, the TCA Area of Responsibility (AoR) threat assessment and broad operational plans for countering the threat were developed and documented.

The (b) (7)(E) Station is a lightly populated and the terrain is mountainous. (b) (7)(E) (b) (7)(E) . Border Zones (b) (7)(E) of the U.S. border with Mexico; (b) (7)(E) The TCA sector geography and terrain are shown on the left in the figure below. The (b) (7)(E) threat situation is captured by interdiction location on the right in the figure.

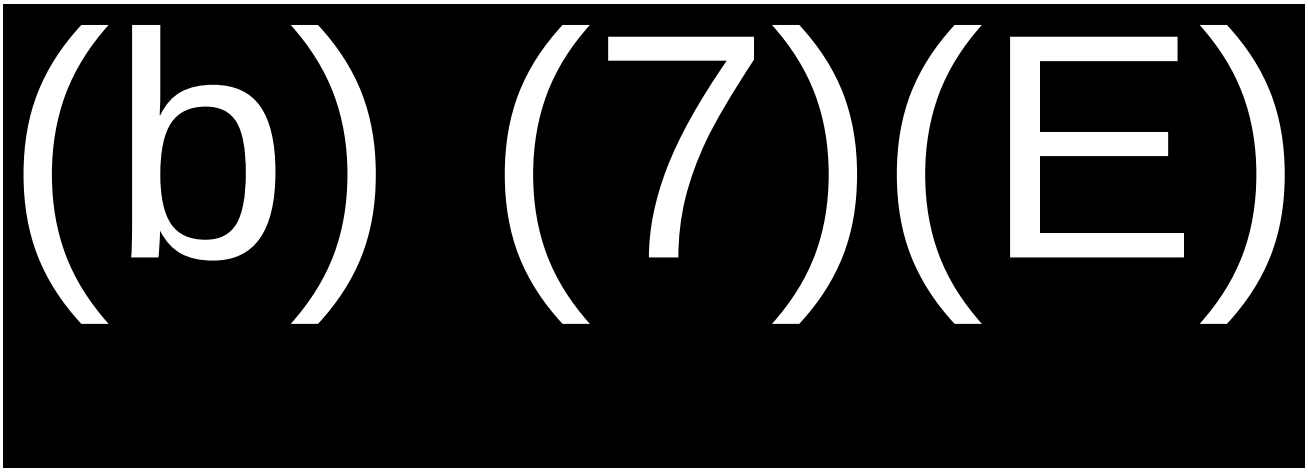


Figure 2 Threat Area

Step 2 Mission Analysis

For the CGAP pilot conducted at the (b) (7)(E) Station in 2013, the data collection methods used were a combination of document reviews, a Station data pull and discussions with Station personnel. Missions, threats, Station assets and scenarios were utilized as the context for a Collaborative Analysis Exercise (CAE), conducted with Station agents from May 14–16, 2013, in (b) (7)(E) Arizona with both (b) (7)(E) Station and Tucson Sector participants.

The (b) (7)(E) Station baseline was assessed during the May 2013 CAE by Mission Essential Tasks (MET). The METs are predict, detect, identify, classify, track, respond, and resolve. The METs associated with surveillance are predict, detect, identify, classify and track. Communications was evaluated as a separate category. A summary of the CAE's baseline assessment by MET is shown in the following figure.

Required capabilities, gaps, and any agent provided solutions were also documented on Station CORE Cards[4] during the 2013 CAE. Surveillance capability needs fall under the overarching capability of Domain Awareness. The summary of the required capabilities and their associated gaps collected during the exercise is shown. The gap specific to surveillance is outlined in red in the table.

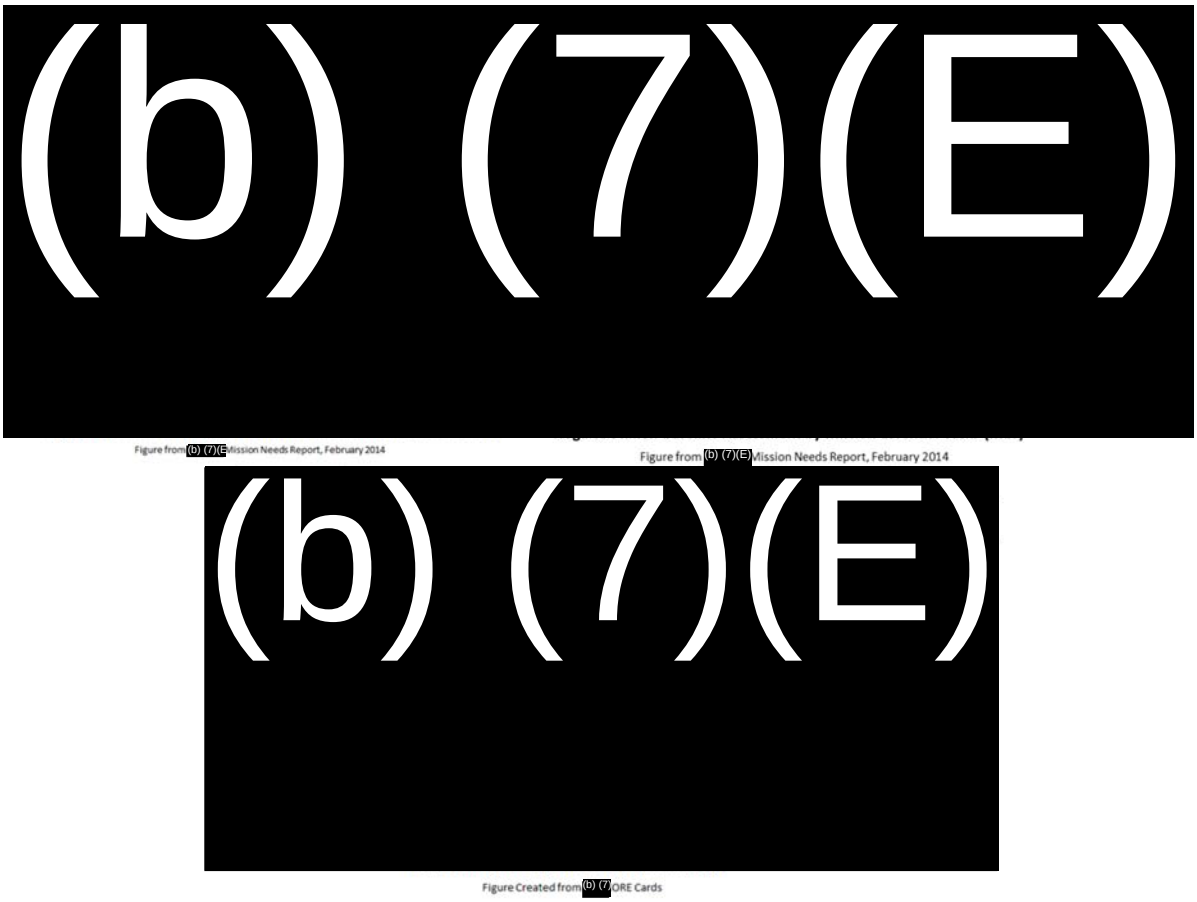


Figure 3 CGAP Mission Analysis

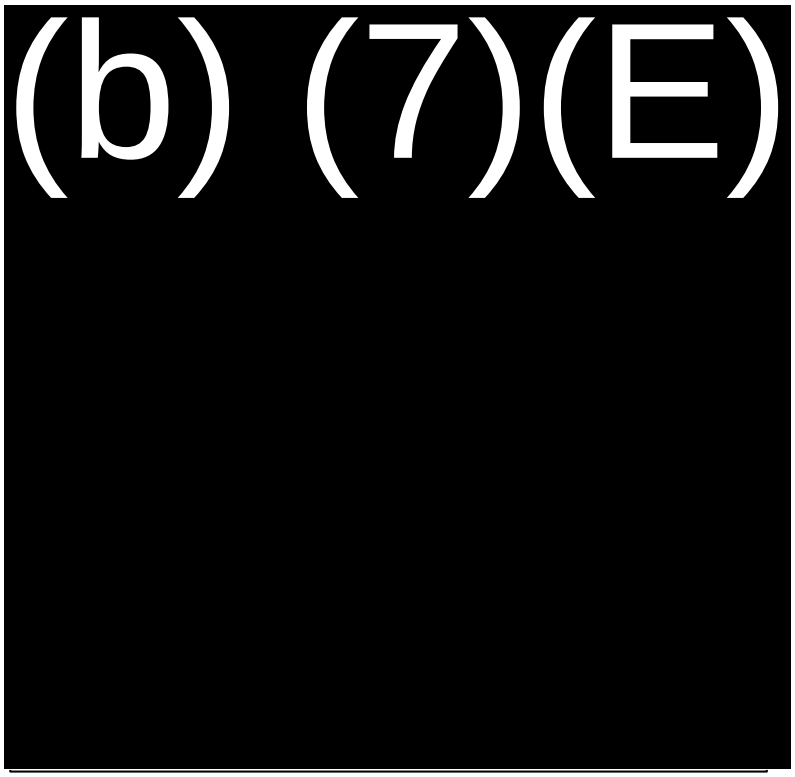
2014 (b) (7)(E) mission analysis activities produced the following quantitative and qualitative data: physical environment, analysis of the threat, capability baselines, capability gaps, mission need statements, and agent provided solutions (potential). Station CORE cards were included in the submission.

Step 3 Planning

In August, 2015, follow-on "capability based planning" took place for the TCA Sector focusing on (b) (7)(E) (b) (7)(E) stations. Data, strategic guidance, sector plans, threat assessments, CGAP outputs, subject matter experts, and analytical support (systems engineering and modeling/simulation) were utilized to develop capability requirements and potential courses of action to mitigate capability gaps for the three Tucson AoRs. Specific tasks completed during the August workshop were:

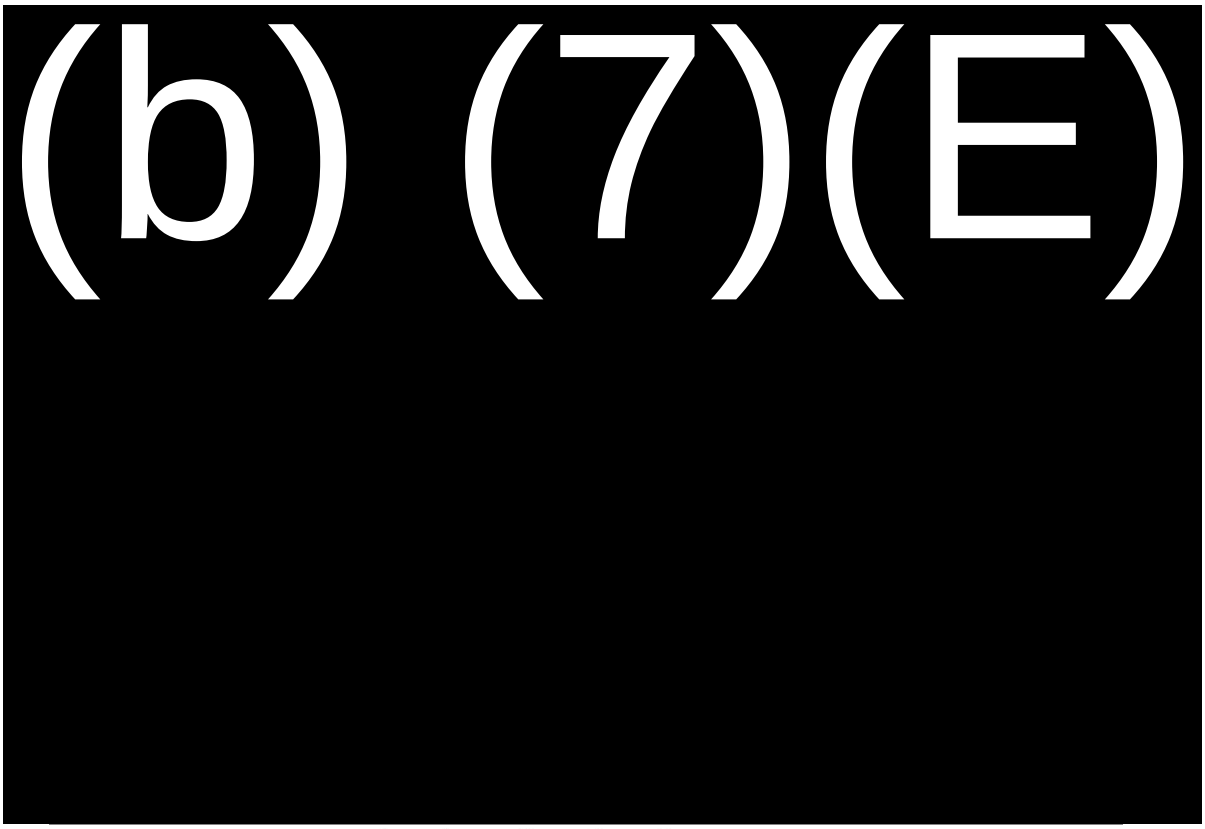
[4] Capabilities, Objective Measures, Resources, Evaluative Methods (CORE) Cards

- **Initial capability requirements** were gathered by systems engineers. There were 73 total initial capability requirements (50 capability requirements were in surveillance category) collected for (b) (7)(E) during the 2015 Planning Workshop. In October of 2015, USBP prioritized all capability requirements for the Southwest Border Priority AORs ((b) (7)(E) The requirements were prioritized based on three factors: geographic priority, AoR weighting of capability gaps, and prevalence across priority AoRs. The figure shows a sample of three of the surveillance initial capability requirements extracted from the prioritization worksheet.



- **Candidate courses of action (COA)** were explored using modelling and simulation tools. Fixed, semi-permanent, and mobile surveillance solutions were considered as part of the solution sets. Initially, analysis was conducted that verified closure of surveillance gaps for fixed assets as a result of planned (b) (7)(E) upgrade and IFT deployments. Then three candidate COAs were examined to address the surveillance gaps in areas where no deployments were planned, (b) (7)(E)

(b) (7)(E)



From (b) (7)(E) *Baseline Comparisons Study*, December 2015.

Figure 4 Area Covered Map

As part of the course of action planning, participants in the 2015 Planning Workshop recommended some other candidate surveillance COAs for consideration. These articulated in the table below.

Tier	Timeline	Supplemental Surveillance COAs
1	0-2 Years	(b) (7)(E)
2	2-5 Years	
3	5+ Years	

Step 4 Execution

Working with solution providers, USBP mapping of TCA requirements and COAs to solutions continues.

In FY16, USBP will work with solution providers as solutions are identified and assessed for cost, schedule and performance to address requirements and later submitted for resource planning.

Step 5 Assessment

USBP will continue to participate in and monitor (b) (7)(E) and IFT deployment activities (test and evaluation, capabilities and limitations assessments, operational user assessments) to ensure established requirements are met and to ensure successful deployment. In FY16, (b) (7)(E) and IFT baselines will be established and transition to lifecycle management. USBP will monitor implementation of other fielded solutions as they are deployed.

Step 6 Lifecycle Management

As noted in the GAO Report[5] conclusions regarding the contributions and impacts of its surveillance technologies on Border Patrol's enforcement efforts cannot be formed solely on the basis of the proximity of apprehension or seizure events to the locations of its surveillance technologies. However, analyzing data on apprehensions, seizures, and asset assists in combination with other relevant performance metrics or indicators as appropriate could provide more robust analysis of the contributions of surveillance technologies.

Table 1 provides a proposed set of qualitative and quantitative technology performance measures, a subset of these measures have been assessed for (b) (7)(E)

Below, Table 3 provides a mapping of the measures provided in this (b) (7)(E) case study. Measures for technology assists are also provided in this section. Although not a complete assessment of impact and safety, some initial data collection provides measures on assaults and rescues.

Table 3

Measures (Section 2.1)	Information/Evidence
% asset assist for apprehension events	Figure 5
% of asset assists for seizure events	Figure 6
%/# of asset assists with tower range/not in range	Table 4 and Table 5
Percent turn arounds and gotaways in coverage area	Data to be collected
Percent area covered by technology	Figure 3 and 4

[5] GAO-14-368, *ARIZONA BORDER SURVEILLANCE TECHNOLOGY PLAN, Additional Actions Needed to Strengthen Management and Assess Effectiveness,* March 2014

Availability, Reliability, Maintainability	Data to be collected
Surveillance capability assessment measure	Measure in development
Effectiveness rating for MET	Figure 3
Impact agent safety	Figure 7, Figure 8
Impact to a given area	Figure 7, Figure 8

Analysis of technology assists show that technology is a significant contributor to (b) (7)(E) apprehension and seizure events. The figures below provide technology asset assists data over a seven year period for (b) (7)(E) and (b) (7)(E) With the consistent collection of technology assist data, contributions of new deployments can be assessed. (b) (7)(E) towers were upgraded and additional towers deployed in 2014, with System Acceptance Testing (SAT) completed in January 2015. IFT towers were deployed in 2015 with SAT completed in November 2015, reviews for final IFT deployment approval is underway. IFT technology asset assists are not assessed in FY15 data, but will be analyzed for FY16.

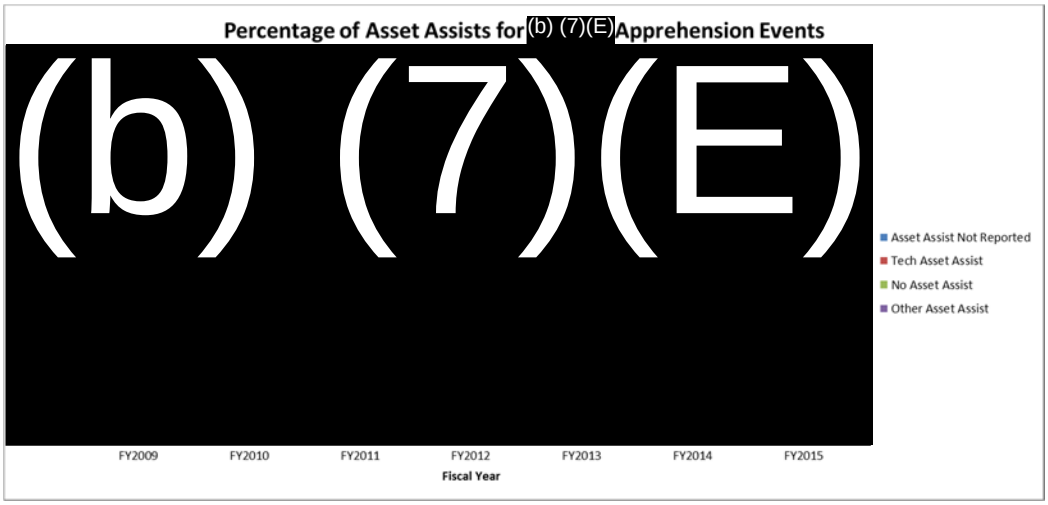


Figure 5 Percentage Assist - Apprehensions

Note:

- Percentages may not add to 100 because of rounding
- Technology Asset Assists include (b) (7)(E) and (b) (7)(E)

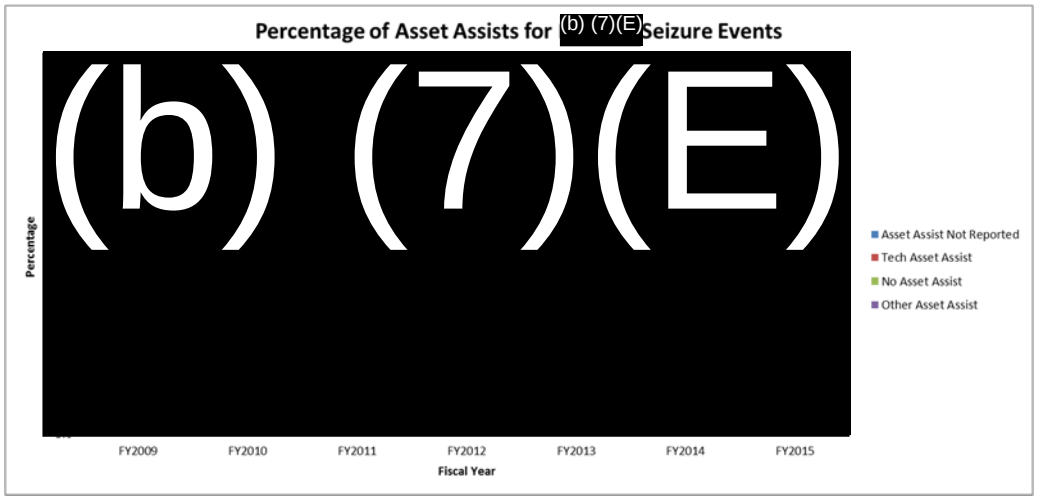


Figure 6 Percentage Assists - Seizures

Note:

- Percentages may not add to 100 because of rounding
- Technology Asset Assists include (b) (7)(E) and (b) (7)(E)

Technology asset assists within range of (b) (7)(E) were analyzed as shown in the table below. To start to assess impacts to agent safety and the area of (b) (7)(E) trends in assaults and rescues and deaths were analyzed as shown in the figures below.

Table 4 (b) (7)(E) Assists - Apprehensions

(b) (7)(E) Apprehension Events	(b) (7)(E)		
	2013	2014	2015
(b) (7)(E)			

Table 1 (b) (7)(E) Assists - Seizures

	(b) (7)(E) Seizure Events		(b) (7)(E)			
	2013		2014		2015	
	Asset or No Assist Recorded	Asset Assist Not Recorded	Asset or No Assist Recorded	Asset Assist Not Recorded	Asset or No Assist Recorded	Asset Assist Not Recorded

(b) (7)(E)

Note:

- Percentages may not add to 100 because of rounding

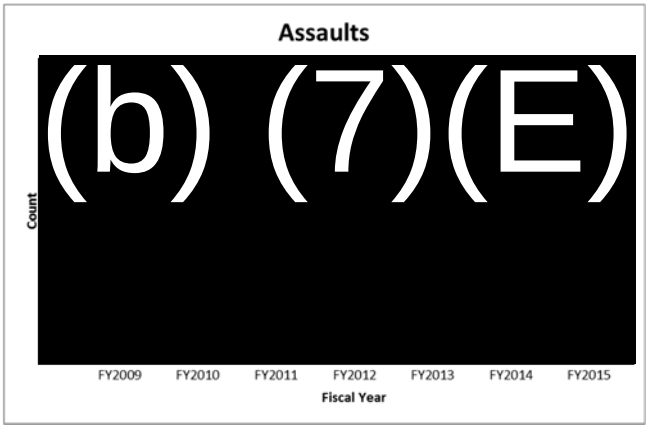


Figure 7 Assults

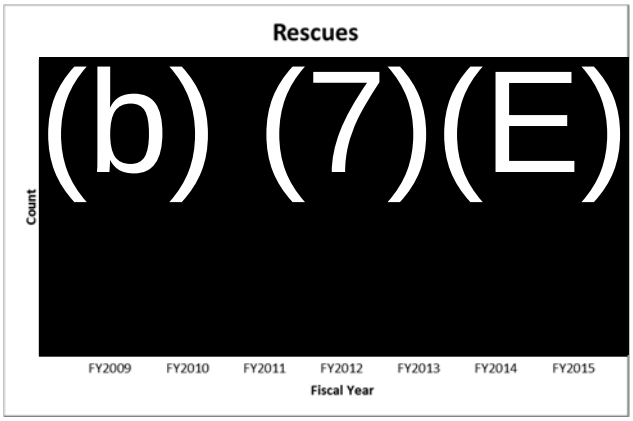


Figure 8 Rescues

In FY16, using technology assist data, along with CGAP measures and technology performance measures, contributions to mission effectiveness will be assessed for recent (b) (7)(E) upgraded and IFT deployments as well as other technologies deployed in (b) (7)(E)